

In re Patent Application of:
CAIN ET AL.
Serial No. 10/658,360
Filing Date: **SEPTEMBER 9, 2003**

REMARKS

The Examiner is thanked for the thorough examination of the present application. In view of the amendments and the supporting arguments presented in detail below, it is submitted that all of the claims are patentable.

I. The Claimed Invention

The present invention is directed to a mobile ad hoc network (MANET). As recited in independent Claim 1, for example, the MANET includes a plurality of mobile nodes each including a wireless communications device and a controller connected thereto. The controller operates in accordance with a multi-layer protocol hierarchy. More particularly, at an upper protocol layer, the controller establishes a quality-of-service (QoS) threshold. At at least one intermediate protocol layer below the upper protocol layer, the controller selects at least one route for transmitting data to at least one destination mobile node based upon the QoS threshold, and determines whether a QoS metric for the selected route falls below the QoS threshold. Furthermore, at a lower protocol layer below the at least one intermediate protocol layer, the controller cooperates with the wireless communications device to determine the QoS metric for the at least one selected route, transmit data to the at least one destination mobile node via the at least one selected route, and adjust signal transmission power based upon a determination that the QoS metric has fallen below the QoS threshold.

Independent Claims 11 and 20 are directed to similar

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MANETs, and independent Claims 28, 34, and 39 are directed to related methods. Each of these claims also recites establishing a QoS threshold at an upper protocol layer, as in Claim 1.

II. The Claims Are Patentable

The Examiner rejected independent Claims 1, 11, 20, 28, 34 and 39 over U.S. Patent No. 6,629,151 to Bahl. Bahl is directed to a wireless LAN system in which network layer interfaces perform static and dynamic queries, as well as requests to set attributes.

It is respectfully submitted that Bahl fails to teach all of the recitations of the above-noted independent claims. As an initial matter, Bahl has nothing to do with MANETs or performing routing in complex MANET environments. Rather, Bahl is directed to querying dynamic aspects of wireless connections in a wireless LAN. An existing wireless LAN typically includes a fixed network with one or more access points connected thereto, and wireless clients or devices access the fixed network via the access points over wireless links. A wireless LAN may have a basic peer-to-peer or "ad hoc" mode, as generally noted at col. 16, lines 6-22 of Bahl. In this mode, wireless devices within range of each other discover and communicate in peer-to-peer fashion without involving central access points.

In contrast, a MANET is a network that is formed of mobile (and potentially stationary) nodes, and is created on the fly as the nodes communicate with each other. The network does not depend on a particular node and dynamically adjusts as some

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nodes join or others leave the network. As discussed in the background of the present application (see, e.g., paragraphs 0002-0004 of the originally filed specification), because MANETs lack a fixed infrastructure, nodes must self-organize and reconfigure as they move, join or leave the network. All nodes are essentially the same, and there is no natural hierarchy or central controller in the network. All functions may be distributed among the nodes. Nodes are often powered by batteries and have limited communication and computation capabilities. Also, the bandwidth of the system is usually limited. The distance between two nodes often exceeds the radio transmission range, and a transmission may have to be relayed by other nodes before reaching its destination. Consequently, a MANET network typically has a multi-hop topology, and this topology changes as the nodes move around. While Bahl mentions in passing "ad hoc" operation of an existing wireless LAN, it does not discuss MANETs or performing MANET routing operations as recited in the above-noted independent claims.

Furthermore, Bahl also fails to teach establishing a QoS threshold at an upper protocol layer as the Examiner contends. In support of this contention, the Examiner simply points to an application layer 100 illustrated in FIG. 2 of Bahl. The only discussion of the function of the application layer 100 provided in Bahl is found at col. 4, lines 27-29, which states that "[t]he application layer 100 directly serves the end user and supports the software applications with which the user interacts." This brief description of the function of the

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application layer 100 cannot fairly be read to include establishing a QoS threshold at an upper protocol layer as recited in the above-noted independent claims.

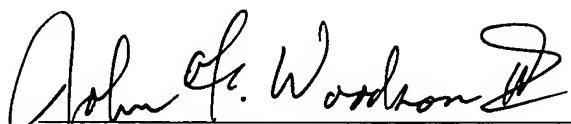
In view of the foregoing, Bahl simply fails to teach or fairly suggest all of the recitations of independent Claims 1, 11, 20, 28, 34 and 39. Since the remaining prior art of record also fails to teach or fairly suggest the noted deficiencies, it is submitted that these claims are patentable over the prior art. Their respective dependent claims, which recite yet further distinguishing features, are also patentable over the prior art and require no further discussion herein.

CONCLUSIONS

In view of the foregoing, it is submitted that all of the claims are patentable. Accordingly, a Notice of Allowance is respectfully requested in due course. Should any minor informalities need to be addressed, the Examiner is encouraged to contact the undersigned attorney at the telephone number listed below.

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Respectfully submitted,



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